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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,572	04/11/2006	Kai Eck	DE 030355	9554

24737 7590 04/20/2007
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
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EXAMINER

BOR, HELENE CATHERINE

ART UNIT	PAPER NUMBER
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3768

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

ED

Office Action Summary	Application No.		Applicant(s)	
	10/575,572		ECK ET AL.	
	Examiner		Art Unit	
	Helene Bor		3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: element 1 representing a cardiac vessel and element R2 representing the second respiratory phase. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 2 recites the broad recitation approximately between 10 and 100, and the claim also recites preferably between 30 and 50 which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 1 & 3-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Mollus'060 (US Patent Application No. 2003/0123606).

Claim 1: Mollus'606 teaches a device for providing an angiographic image of a body structure (Page 1, Para 0001-0002) matching a given heartbeat phase and a respiratory phase (Page 3, Para 0032). Mollus'606 teaches a device with a database [memory for storing] with angiograms [X-ray image of body volume] from different heartbeat phases and respiratory phases (Page 1, Para 0012 & Page 2 Para 0020), and a data processing apparatus linked thereto (Page 2, Para 0019). Mollus'606 teaches a device for calculation of a function, which describes a change in the body structure dependent upon the respiratory phase (Page 1, Para 0012 & Page 2 Para 0020), which calculation takes place based on from the angiograms [X-ray image of body volume] in the database [memory for storing] (Page 3, Para 0028). Mollus'606 teaches a device for the generation of the angiographic image (Page 1, Para 0001-0002) to be produced from at least one angiogram of the database (Page 3, Para 0030) whose heartbeat phase matches the given heartbeat phase with the aid of the calculated function (Page 3, Para 0030-0033).

Claim 3/1: Mollus'606 teaches a device characterized by a function (FIGURE, Block 8) that describes a change in the position of the body structure [such as the heartbeat and the respiration] (Page 3, Para 0033).

Claim 4/1: Mollus'606 teaches a device characterized by a function (FIGURE, Block 8) that describes a change in the position of the body structure [such as the heartbeat and the respiration] (Page 3, Para 0033) by a correlation (Page 3, Para 0031) of the mutual information in relation to a reference angiogram [current fluoroscopic image sequence] (FIGURE, Element 9).

Claim 5/1: Mollus'606 teaches using digital subtraction angiography (DSA) to attenuate [discard] non-interesting structures [static image objects] and to enhance structures of interest (Page 3, Para 0034).

Claim 6/1: Mollus'606 teaches a device wherein a display device for superimposed representation of a current image of the body structure and the provided angiographic image (Page 2, Para 0013-0014).

Claim 7/1: Mollus'606 teaches a device that includes an image-forming apparatus, such as an X-ray apparatus and/or an MRI device (Page 2, Para 0015 & 0017).

Claim 8/1: Mollus'606 teaches a device that includes an electrocardiographic device for determining an electrocardiogram (Page 3, Para 0032).

Claim 9/1: Mollus'606 teaches a device that includes a respiratory phase sensor (Page 3, Para 0032).

Claim 10: Mollus'606 teaches a method for providing an angiographic image of a body structure (Page 1, Para 0001-0002) matching a given heartbeat phase and a respiratory phase (Page 3, Para 0032). Mollus'606 teaches a method with a database [memory for storing] with angiograms [X-ray image of body volume] from different heartbeat phases and respiratory phases (Page 1, Para 0012 & Page 2 Para 0020), and a data processing apparatus linked thereto (Page 2, Para 0019). Mollus'606 teaches a method for calculation of a function, which describes a change in the body structure dependent upon the respiratory phase (Page 1, Para 0012 & Page 2 Para 0020), which calculation takes place based on from the angiograms [X-ray image of body volume] in the database [memory for storing] (Page 3, Para 0028). Mollus'606 teaches a method for the generation of the angiographic image (Page 1, Para 0001-0002) to be produced from at least one angiogram of the database (Page 3, Para 0030) whose heartbeat phase matches the given heartbeat phase with the aid of the calculated function (Page 3, Para 0030-0033).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mollus'606 et al. (US Patent Application No. 2003/0123606 A1) and further in view of Langer'716 et al. (US Patent No. 6,496,716 B1).

Claim 2/1: Mollus'606 teaches the use of angiograms (Page 1, Para 0002). Mollus'606 fails to teach how many angiograms there are. However, Langer'716 teaches that angiograms comprise a set of 60 to 125 images. It would have been obvious to combine the teaching of Mollus'606 and Langer'716 in order to provide a detailed view of different aspects of the cardiac anatomy (Col. 1, Line 31-34).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Keren; Hanan. Imaging methods and apparatus particularly useful for two and three-dimensional angiography, 06/22/2004. US 6754522 B2.
- b. Larson; Andrew C. et al. Method for synchronizing magnetic resonance imaging data to body motion, 09/28/2004. US 6798199 B2.
- c. Lienard; Jean et al. Method and apparatus for cardiac radiological examination in coronary angiography, 06/20/2006. US 7065395 B2.

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- d. Prince; Martin R. Method and apparatus for administration of contrast agents for use in magnetic resonance arteriography, 05/03/2005. US 6889072 B2.
- e. Shao; Lingxiong et al. Physiological model based non-rigid image registration, 10/03/2006. US 7117026 B2.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helene Bor whose telephone number is 571-272-2947. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eleni Mantis-Mercader can be reached on 571-272-4740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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